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जन सूचना प्रतीकों के विकास और अनुप्रयोग के सिद्धांत

Indian Standard

DEVELOPMENT AND PRINCIPLES FOR APPLICATION OF PUBLIC INFORMATION SYMBOLS

ICS 01.080.10

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

December 2004

Price Group 8

Basic Standards Sectional Committee, MGP 01

NATIONAL FOREWORD

This Indian Standard which is identical with ISO/TR 7239 : 1984 'Development and principles for application of public information symbols' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendations of the Basic Standards Sectional Committee and approval of the Medical Instruments, General and Production Engineering Division Council.

The text of the ISO Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.

b) Comma (,) has been used as a decimal marker in the International Standards while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

CROSS REFERENCES

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards which are to be substituted in their place are listed below along with their degree of equivalence for the editions indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 3864 : 1984 Safety colours and safety signs[1]	IS 9457 : 1980 Safety colours and safety signs	Technically equivalent
ISO 4196 : 1984 Graphic symbols — Use of arrows	IS 3232 : 1999 Recommendations on graphical symbols for process flow diagrams, piping and instrumentation diagrams (*second revision*)	do
ISO 7000 : 1989 Graphical symbols for use on equipment — Index and synopsis	IS 12857 : 1989 General principles for the creation of graphical symbols for use on equipment	do
ISO 7001 : 1990 Public information symbols	IS 15504 : 2004 Public information symbols	Identical

Where there are no corresponding Indian Standards for the International Standards referred in this Indian Standard reference to the relevant International Standards may be made.

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[1] This standard has been revised as ISO 3864-1 : 2002 and ISO 3864-2 : 2004 brought out in two parts.

Indian Standard

DEVELOPMENT AND PRINCIPLES FOR APPLICATION OF PUBLIC INFORMATION SYMBOLS

1 Scope and field of application

This Technical Report provides a set of recommended procedures to be followed and sets forth the essential technical criteria which should be taken into account when developing or considering the use of graphical symbols as a means of visual pictorial communication.

The field of application is mainly in public areas, but the recommendations of this Technical Report concerning visual design criteria can equally be applicable to perception problems in other areas where graphical symbols are used as the means of communication.

2 References

ISO 3461, *Graphic symbols — General principles for presentation.*

ISO 3864, *Safety colours and safety signs.*

ISO 4196, *Graphic symbols — Use of arrows.*

ISO 7000, *Graphical symbols for use on equipment — Index and synopsis.*

ISO 7001, *Public information symbols.*

3 Abbreviations and definitions

3.1 Algebraic symbols

The meanings of the symbols used in the formulae adopted in this Technical Report are as follows:

m_d represents the linear dimension of the smallest significant detail in the graphical symbol (see 5.8)

m_l represents the minimum line thickness for the representation of detail in a symbol (see 5.8.1)

d_is represents the distance between the symbol and the internal edge of the symbol enclosure (see 6.1)

s represents the linear dimension of the symbol as defined by the corner marks in the guideline example of ISO 7001 (see annex A)

d_e represents the internal dimension of one side of a diamond enclosure (see 6.2.1)

d represents the internal diameter of a circular enclosure (see 6.2.2)

b represents the internal base dimension of an equilateral triangular enclosure (see 6.2.3)

D represents the viewing distance (i.e. the distance it is anticipated the viewer will be away from the sign) (see 6.4)

X represents the displacement of the centre of the sign from the central line of vision, measured at right angles to the central line of vision (see 6.4.1)

3.2 Definitions

For the purposes of this Technical Report the following definitions apply.

3.2.1 apparent size: Enclosures or symbols which have different geometric dimensions but which nevertheless are perceived by the eye as being of the same size.

3.2.2 appropriateness ranking test: A procedure for placing symbols, designed for a given referent, in descending order of merit according to their considered appropriateness.

3.2.3 background: That part of a sign immediately behind a symbol or word (see annex B).

3.2.4 colour code: Colours used symbolically to represent particular meanings (see ISO 3864).

3.2.5 comprehension test: A procedure for eliciting a response from the public which enables measurement of the degree of comprehension of the proposed symbols.

3.2.6 conspicuity: The capability of one entity in the visual field to be more easily noticed than any surrounding information.

3.2.7 detection: The ability of the visual system to pick out stimuli in the visual field.

3.2.8 displacement: Distance between the centre of a symbol located in a public place and the central line of the normal direction of vision of the user, measured at a right angle to that central line of vision (see 6.4).

3.2.9 enclosure: That part of the sign which encloses the symbol (see annex B).

3.2.10 field of application: The context in which the use of a symbol to convey a message is appropriate.

3.2.11 function: The purpose of the symbol.

3.2.12 guideline example: A selected graphical interpretation of the standard image content in the form of a symbol as published in ISO 7001.

3.2.13 image content: The elements of the symbol and their relative disposition.

3.2.14 legibility: The property of characters and symbols which enables one character to be discriminated from another.

3.2.15 matching test: A procedure where respondents select, from a set of symbols, the symbol which they judge best matches a given referent (see 4.2.2.4).

3.2.16 negating stroke: A graphical device in the form of a line intended to negate a symbol's original intended message.

3.2.17 public information symbol: A graphical symbol intended to give information to the general public, the understanding of which is not normally dependent on specialist or occupational training.

3.2.18 referent: The subject represented by the symbol.

3.2.19 resolution: The ability of the visual system to discriminate small details. This ability is affected by several factors, including viewing distance, size of details and the separation between them (see 5.8).

3.2.20 shape code: A geometrical shape used symbolically to represent a particular meaning (see ISO 3864).

3.2.21 sign: A configuration of visual elements — symbols, text and other shapes — produced to convey a given message.

3.2.22 standard image content: The image content as described in words for each referent, and published in ISO 7001.

3.2.23 symbol: A visually perceptible figure, reproduced by means of writing, drawing, printing or other manufacturing technique, intended to convey a particular meaning.

3.2.24 symbol set: A related range of symbols, each symbol conforming to the verbal description of the image content, and each symbol relating to a particular area of public interest, for example transport, leisure, sport, accommodation, etc.

3.2.25 symbol variants: Alternative symbol designs for a given referent.

3.2.26 viewing angle: The angle formed by the plane of a sign and the central line of vision of an observer (see figure 5).

3.2.27 visual size (visual angle): The angle subtended by two lines drawn from the eye of the observer to the two extremes of the longest axis of the symbol (see figure 4).

4 Procedures for the development or adoption of public information symbols

4.1 Adoption

Before proceeding to the development of a new symbol for a particular function, reference should first be made to ISO 7001 in order to establish that a referent has not already been standardized.

4.1.1 ISO procedures

The use of the procedures outlined in annex 2A of the *Directives for the technical work of ISO* may also be used to establish whether work has already commenced to standardize a referent for the function required.

4.2 Development

4.2.1 Determination of need

Before proceeding to develop a symbol for a particular function, it should first be clearly established that a graphical symbol to serve that function is definitely needed.

4.2.2 Design development

Having established that a need exists for a new symbol to be designed, original designs for a public information symbol should be based on results obtained by following the procedures indicated in figure 1.

4.2.2.1 Trial designs

This initial stage involves both the generation of trial designs and the collection of any designs in use for each of the referents under consideration. This preliminary stage will generate many more versions of the symbols than it is possible to test comprehensively, so a limited number of the most appropriate symbols for further investigation are selected using a method called an "appropriateness ranking test", as defined in 3.2.2.

With this limited number of symbol alternatives for a given referent, a comprehension test is then conducted to investigate which elements of these symbols are best comprehended with the intended meaning.

For this stage of testing and evaluation, not only are symbol variants required for the referent, but a definition of the function of the referent and its field of application is also required. These aspects are critical to the testing technique. Only in this way can any sensible and useful interpretation be made of the comprehension test data.

At this stage, no one symbol variant is being tested with a view to adoption, but rather, the symbols under test will allow the selection of the pictorial elements which are likely to make a useful symbol in practice. The results of the comprehension test when interpreted in this way lead to a verbal description of the image content of the symbol. This then becomes the standard for the referent.

4.2.2.2 Poor response

If the level of comprehension of the proposed symbol is unsatisfactory, new trial designs are initiated or a redefinition of the scope or field of application of the symbol is attempted. Thereafter, the procedures indicated in figure 1 are repeated as required.

4.2.2.3 Symbol sets

If the level of recognition of the proposed symbols is satisfactory, prepare verbal descriptions of the image content and proceed to prepare the symbol set.

Individual symbols should be designed as elements of a system. It should be borne in mind that the communication power of an individual symbol is dependent on a certain degree of consistency with other components of the set but also on distinctiveness. Distinctiveness of an individual symbol within a set prevents confusion. Also, a set of symbols having consistency of design reinforces the possibility of detection of the individual symbols in complex surroundings.

4.2.2.4 Matching test

The purpose of the matching test is to determine how well the symbols work as a related set and whether any aspect of their visual design leads to confusion. Results from the matching test are then used to modify the previously derived verbal description of the image content so as to avoid confusion in practice.

4.2.2.5 Standard image content and guideline example

ISO 7001 lays down three elements:

a) the standard image content (see 3.2.22);

b) the function (see 3.2.11);

c) the field of application (see 3.2.10).

It should be noted that it is not the graphical form as such that is being standardized but the image content. In this way it is hoped that flexibility within ISO 7001 will be available for cultural influences and design styles in different countries. The guideline examples are provided merely to guide the users of the standard in the interpretation of the standard image content. It is not essential to use the guideline example in order to conform to the standard, although its use is encouraged (see annex A).

4.3 Procedural guidelines

4.3.1 Determine the need for a symbol

4.3.2 Is the referent for which you wish to introduce a symbol shown in ISO 7001 ?

YES

4.3.3 You should adhere to the standard image content as shown in ISO 7001.

4.3.3.1 You may adopt the guideline example shown in ISO 7001; or you may modify it (provided you adhere to the standard image content) to fulfill your domestic needs.

4.3.3.2 Refer to ISO 7001 for any information on the use of colour in association with the referent. Use that information to develop the design brief.

4.3.3.3 If you produce a symbol different from the guideline example shown in ISO 7001, evaluate your design by using the matching test.

NO

4.3.4 Are any symbols for the referent widely used in your country?

YES

4.3.4.1 Evaluate them by following the flow chart (see figure 1).

4.3.4.2 Refer to any relevant national or International Standard concerning the use of shape and colour. Use that information to develop the design brief.

NO

4.3.4.3 Continue verbal messages, or contact relevant international agencies.

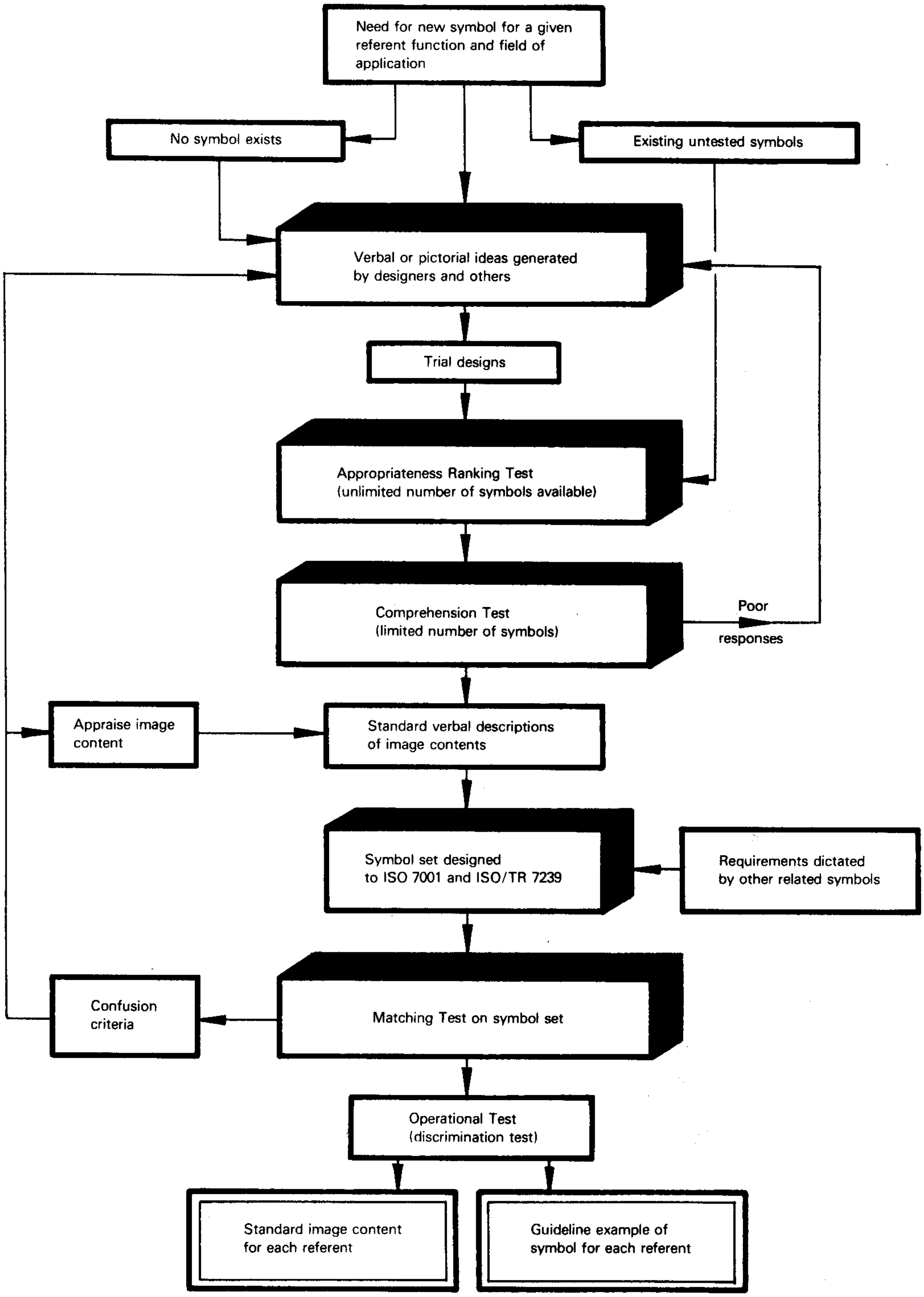

Need for new symbol for a given referent function and field of application
No symbol exists
Existing untested symbols
Verbal or pictorial ideas generated by designers and others
Trial designs
Appropriateness Ranking Test (unlimited number of symbols available)
Comprehension Test (limited number of symbols)
Poor
responses
Appraise image content
Standard verbal descriptions of image contents
Symbol set designed to ISO 7001 and ISO/TR 7239
Requirements dictated by other related symbols
Confusion criteria
Matching Test on symbol set
Operational Test (discrimination test)
Standard image content for each referent
Guideline example of symbol for each referent

Figure 1 — Procedure for the development of public information symbols

5 Visual design criteria for the development of public information symbols

5.1 General

The widely differing characteristics of the surroundings in which public information symbols are used preclude rigid recommendations. It is for professional designers in visual communication to interpret and apply the information in this Technical Report after appropriate assessment of specific surroundings.

The following recommendations apply to symbols placed in a vertical plane and not using reflective material or internally illuminated signs.

5.2 Construction of a symbol

The use of grids may help to maintain similar apparent size and consistency within sets of symbols. (See 4.2.2.3, concerning the design of sets of symbols.) The variety of visual components which must be used in public information symbols however precludes the use of restrictive geometric patterns. No symbol design should be forced to fit within a basic grid to the detriment of its communication.

5.3 Proportions of a symbol

Long, narrow forms are not as easily perceived as forms in which height and width are similar. A height to width ratio of 1:4 is the maximum recommended for use in public information symbols.

NOTE — This refers to the symbol only and not to other components such as the negating stroke or an enclosure line.

5.4 Symmetry

Symmetrical forms are more easily perceived. Symbols therefore need to be designed with left/right symmetry whenever convenient. Not all symbols need to be symmetrical however.

5.5 Directional characteristics

When symbols having explicit or implicit directional characteristics are combined with a directional arrow, directional conflict should be avoided, by appropriate lateral reversal of the symbol. The design of any such symbol should permit reversal.

5.6 Solid or outline forms

Silhouette is more effective than outline. Solid forms therefore should be used in preference.

If however, symbols in outline form must be used, the interior of the symbol should differ in colour or in pattern from that of the background.

5.7 Number of details

The ratio of perimeter to area of the symbol should be minimized, as this, in general, tends to improve the degree of discrimination of the form. Only details that contribute to better comprehension should be included. Unnecessary details and elements that are dependent upon fashion and foreseeable changes in the appearance of the object portrayed should be avoided.

5.8 Minimum dimension of significant details (m_d)

The recommendation made here is based on extrapolation of research on visual acuity and letter form legibility. The recommended values are to establish reliable legibility and therefore exceed threshold values.

The limit of resolving power of the eye adopted here is based on the perception of the Snellen letter "E" used for visual acuity measurements. Subjects with normal vision can reliably recognise letter "E" when it subtends a visual angle of 5′ (see 3.2.27). Each stroke or separating space subtends an angle of 1′ i.e. 0,3 mm for each metre of viewing distance.

To ensure reliable recognition, this threshold value has been multiplied by a safety factor of 3.

Minimum significant detail within a symbol should therefore be calculated as follows:

1 mm of significant detail (m_d) for every metre of viewing distance (D), or

$$m_d \geqslant \frac{D}{1\,000}$$

NOTE — The dimensions quoted in this section are rounded up to facilitate their memorization and use.

5.8.1 Minimum line thickness for significant detail (m_l)

Where there is no interference from other visual elements, the line thickness may be calculated using a safety factor of 1,5.

Minimum line thickness for significant detail in such cases should be calculated as follows:

0,5 mm of line thickness (m_l) for every metre of viewing distance (D), or

$$m_l \geqslant \frac{D}{2\,000}$$

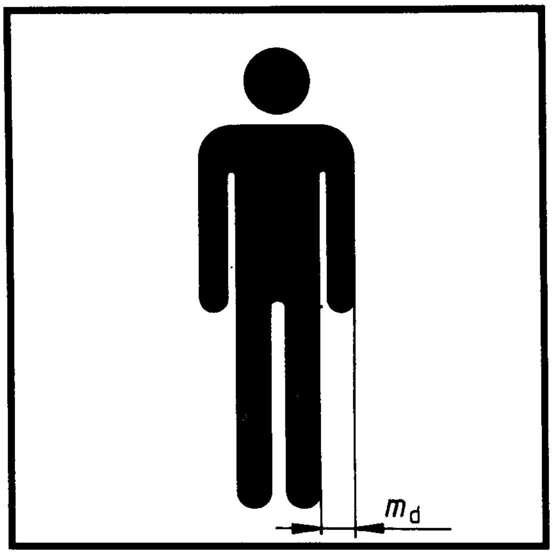


Figure 2 — Example of significant detail

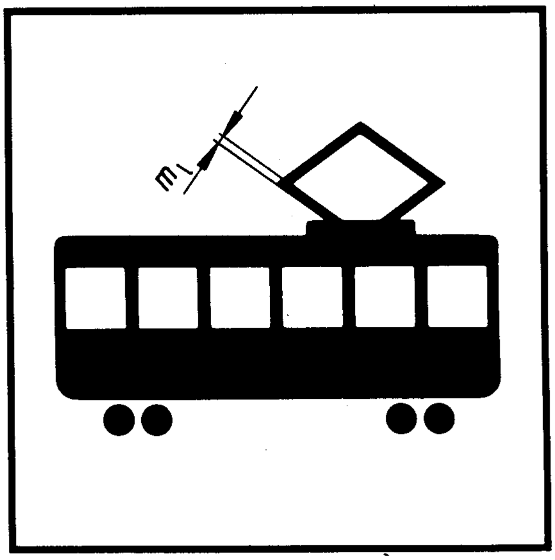


Figure 3 — Example of line thickness for significant detail

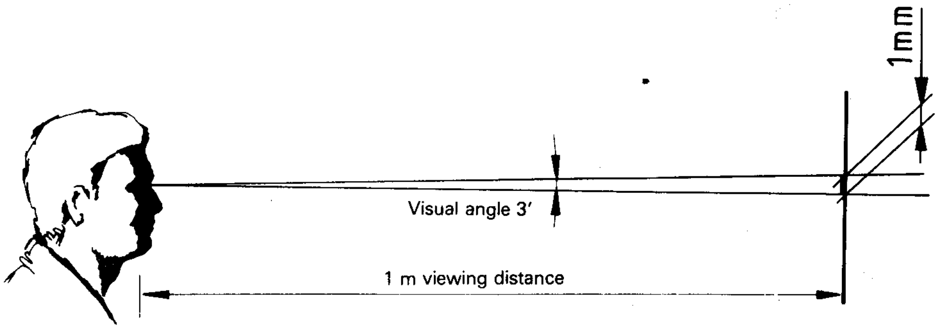


Figure 4 — Visual angle
(Illustration not drawn to scale)

5.9 Reproduction/reduction

Care should be taken at the design stage to produce originals suitable for significant reduction in size.

Faithful reproduction without loss of definition or impairment of recognition depends on the reproduction process used in making the reduction. Another means of overcoming reduction problems is by designing a simplified version of the original, specifically suited to extensive reduction. This version should, nonetheless, still comply with the standard image content.

5.10 Negation

The comprehension of verbally presented negative information is more difficult than that of positive information of a similar form. There is as yet no experimental data that suggests this is also true when the information is presented as a graphical symbol.

However, on the basis of the experience related to verbal communication, it is recommended that, if a concept can be conveyed either by a positive or a negative command, the positive message should be used. Whenever possible, however, both negative and positive messages should be tested before adopting the positive message as being more effective.

5.11 Combination of symbols (composite symbols)

In order to present certain concepts it may be necessary to combine symbols. Such composite symbols, even where based on standardized symbols, should be considered as new graphical symbols which are subject to the same testing as any other symbol. Composite symbols should be formed from as few component elements as possible.

5.12 Interaction between symbols

Display of grouped symbols occurs frequently within a sign system. This should be taken into account at the design stage, since there is often interaction between adjacent symbols. When designing the symbols, the designer should therefore bear in mind that they will be used in association with one another and grouped to form composite displays.

5.13 Apparent size

Consistency in the apparent size (see 3.2.1) of symbols within a set (excluding the frame or enclosure), cannot always be achieved by matching the longest dimension of individual symbols. In most cases the dimensions will have to be modified to compensate for any apparent perceptual inconsistency.

5.14 Size of symbol

Symbols should normally be constructed within square enclosures. For the purposes of this Technical Report, and in line with ISO 7001, the internal edge of the square enclosure is the size of the symbol. The square enclosure should be indicated in the final design by corner marks (see annex A). (For non-square enclosures, see 6.2.)

6 Implementation

6.1 Interaction between symbols and enclosures

The geometric shape on which symbols will eventually appear, and the effect of a negating stroke (if required) should be considered when designing the symbol.

Normally, symbols for public information should be presented within square enclosures. In appropriate cases however, diamond, circular and triangular enclosures may be used. For very small reproduction however, such as for timetables, maps, guides, etc., it is advisable to omit the enclosure.

The distance (d_{is}) between the symbol and the internal edge of the enclosure should be greater than or equal to 1,5 times the minimum dimension for significant details (see 5.8) i.e.

$$d_{is} \geqslant m_d \times 1,5$$

When any component of the symbol approaches and is parallel to the internal edge of the enclosure, the distance that separates them should be increased to at least 2,5 times the minimum dimension for significant details, i.e.

$d_{is} \geqslant m_d \times 2{,}5$

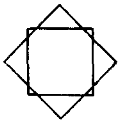
The corners of a square enclosure may be rounded without changing the nominal size of the square, provided the modification does not conflict with the recommendation relating to the distance between symbol and enclosure.

6.2 Enclosure shapes

Care should be taken on the choice of enclosure shapes as they may have different national significance (see ISO 3864). In those cases where it is desirable to maintain the same apparent size of symbol and enclosure, the actual size of enclosure may need to be larger than the equivalent square enclosure. The size of each enclosure shape should be maintained constant within a set of symbols. (See 3.1.)

6.2.1 Diamond enclosure

A diamond enclosure (d_e) is a square the sides of which are at 45° to the horizontal. It is recommended that diamond enclosures be the same size as square enclosures. As a general rule symbols which are designed to fit within a square enclosure will fit, without modification, into a diamond enclosure of the same size. Exceptionally however, it may be necessary, in order to permit the symbol size to be maintained, to enlarge the size of the diamond enclosure. In such cases it is recommended that the size of the diamond enclosure be not more than 1,2 times the size of the square enclosure, or, in other words, not more than 1,2 times the size (s) of the symbol as defined in 5.14, i.e.



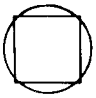
$d_e \leqslant$ 1,2 times the length of the side of a square enclosure, or

$d_e \leqslant 1{,}2\,s$

6.2.2 Circular enclosures

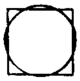
If a symbol is to fit within a circular enclosure the diameter (d) of which is equal to the side of a square enclosure, it will usually be necessary to reduce the size of the symbol.

In order to permit the symbol size to be maintained without drastically changing the size of the enclosure it is recommended that the diameter of the circular enclosure be not more than 1,3 times the length of the side of the square enclosure, i.e.



$d \leqslant 1{,}3\,s$

Where it is necessary for a circular enclosure to have a similar apparent height to the square enclosure, it is recommended that the internal diameter of the enclosure be 1,04 times the length of the side of a square enclosure, i.e.

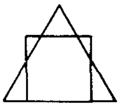


$d = 1{,}04\,s$

6.2.3 Triangular enclosures

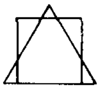
If a symbol is to fit within a triangular enclosure the base dimension (b) of which is equal to the length of a side of a square enclosure, it will usually be necessary to reduce the size of the symbol.

In order to permit the symbol size to be maintained, it is recommended that the length of the base dimension of the triangle be not more than 1,7 times the length of the side of the square enclosure, i.e.



$b \leqslant 1{,}7\,s$

If it is desirable to maintain the same apparent size of enclosures, the base dimension of the triangle should be approximately 1,4 times the length of the side of the square enclosure, i.e.



$b = 1{,}4\,s$

6.3 Viewing angle

Viewing angles (see 3.2.26) should be as near to 90° as possible (see figure 5).

When the viewing angles are less than 45°, the designer in charge of implementation should assess the local situation and decide whether changes in the proportions of symbols and enclosures would improve detection and recognition.

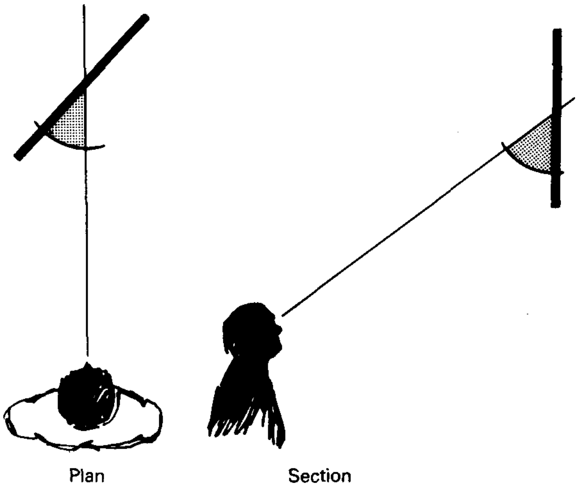


Figure 5 — Viewing angle

6.4 Viewing distance/symbol size/displacement

Viewing distance and symbol size are interdependent factors which require careful consideration during implementation. In a given set of symbols, individual symbols may have different optimum viewing distances. The optimum viewing distance for any set will be determined by the symbols with the shortest viewing distance.

The size of a symbol in a specific location should be determined by inter-relating viewing distance (D) and displacement (X). (See 3.1.)

6.4.1 Maximum recommended displacement

The maximum recommended amount of displacement for normal viewing conditions may be calculated as:

250 mm of displacement for every metre of viewing distance, or

$$X \leqslant \frac{D}{4}$$

This provides an angle of displacement at the eye of the observer of approximately 15° (see figure 6).

6.4.2 Displacement for optimum conspicuity

In cases where immediate detection of a symbol is critical, for example hazard warning, it is advisable to limit the angle of displacement to approximately 5°. This may be obtained by applying the following formula:

80 mm of displacement for every metre of viewing distance, or

$$X \leqslant \frac{D}{12}$$

It is recommended that in all circumstances where a symbol must be placed below eye level, whenever possible the angle of displacement be not greater than 5°.

6.4.3 Symbol size

6.4.3.1 Symbol size to ensure conspicuity

The recommendation made here is based upon extrapolation of research on detection and resolution thresholds. In order to discriminate a specific shape in peripheral vision at 15° of displacement, this shape has to subtend a visual angle of 26′ (approximately 8 mm in size, at 240 mm displacement for every metre of viewing distance). This threshold value has been multiplied here by a factor of 3 to ensure reliable conspicuity. According to the above, the determination of symbol size in relation to viewing distance should therefore be calculated on the basis of:

25 mm of symbol size (s) for every metre of viewing distance (D), i.e.

$$s = \frac{25\,D}{1\,000}$$

This recommendation is aimed at ensuring conspicuity. In order to relate this recommendation to the minimum dimension of significant detail, refer to 5.8. On the basis of the recommendation established in 5.8 the minimum dimension of significant details will be 1/25 of the size of the symbol ($m_\text{d} = s/25$).

The minimum line thickness recommended (see 5.8.1) will therefore be 1/50 of the size of the symbol ($m_\text{l} = s/50$).

The recommended size of a symbol is based upon the assumption that it will not be required to function outside a 15° angular displacement from the central line of the normal direction of vision of the users. Designers should consider the 15° angular displacement assumption when placing symbols designed to these recommendations, because symbols would need to be unacceptably large to ensure conspicuity outside this range.

6.4.3.2 Symbol size to satisfy legibility

When conspicuity is not a concern, the size of the symbol can be smaller and still maintain good legibility. In this case the following formula for determination of symbol size in relation to viewing distance should be applied:

12 mm of symbol size (s) for every metre of viewing distance (D), i.e.

$$s = \frac{12\,D}{1\,000}$$

In order to relate this recommendation to the minimum dimension for significant detail (5.8), the following formula should be applied:

$$m_\text{d} = \frac{s}{12}$$

In order to relate this recommendation to the minimum line thickness (5.8.1), the following formula should be applied:

$$m_\text{l} = \frac{s}{24}$$

When the light in a particular location is low, or when the surroundings are particularly complex, consideration should be given to increasing the size of symbols or reducing the angle of displacement.

In cases where immediate detection of a symbol is critical, for example hazard warning, or in cases where the location of the symbol is below normal eye level and may consequently be obscured by traffic, it may be necessary to increase the visual size.

Minimum size of the symbol to ensure conspicuity:
25 mm for every metre of viewing distance

Minimum size of the symbol to satisfy legibility:
12 mm for every metre of viewing distance

Maximum displacement (X) for non-critical symbols:
250 mm for every metre of viewing distance

Maximum displacement (X) for hazard-related or other critical symbols:
80 mm for every metre of viewing distance

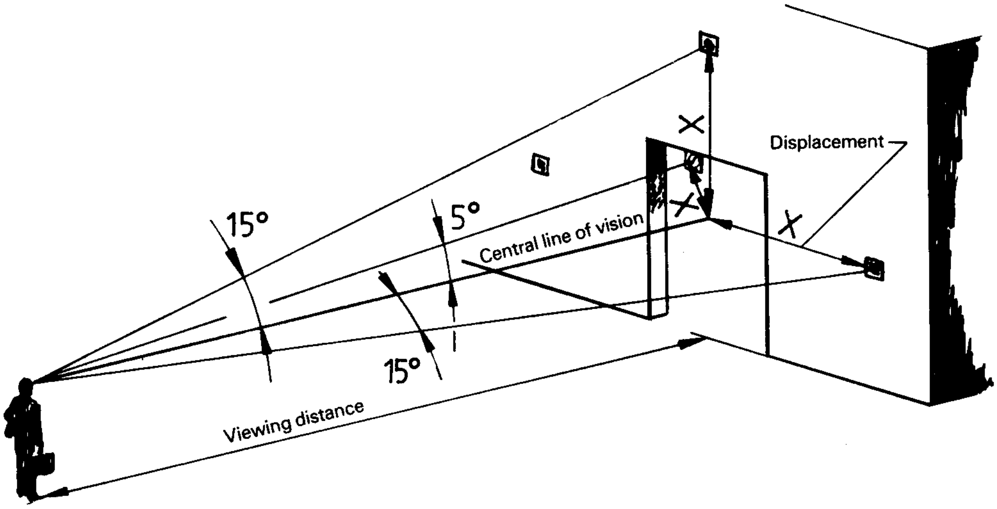
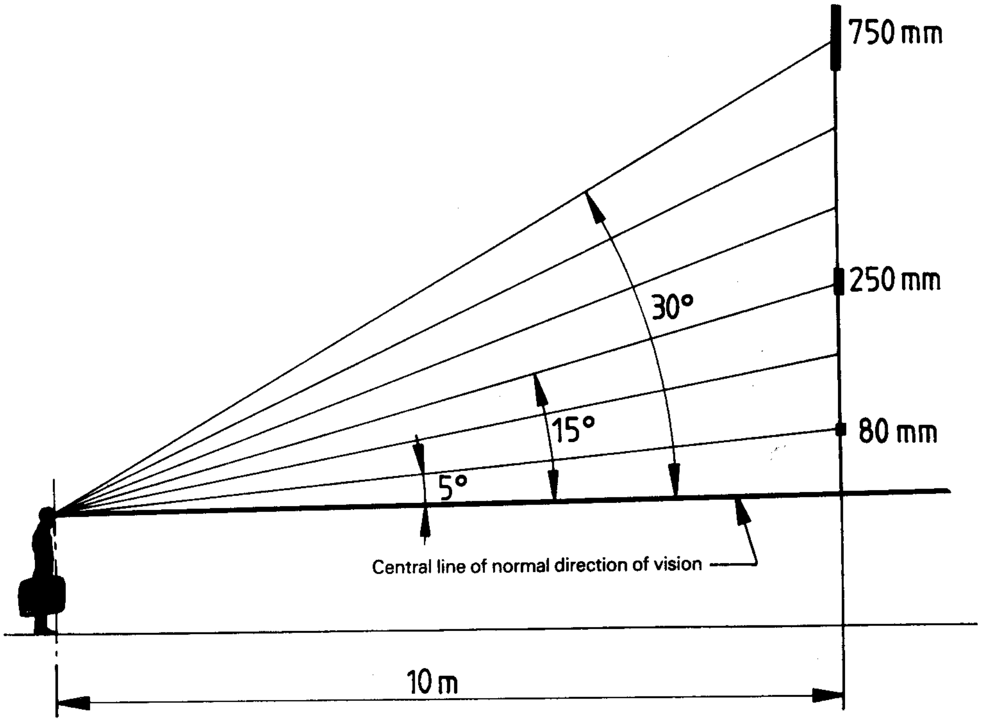


Figure 6 — Viewing distance, symbol size and displacement from the central line of the normal direction of vision



NOTE — A symbol 80 mm in size at 5° displacement would have to be 250 mm in size at 15° displacement and 750 mm in size at 30° displacement to maintain similar conspicuity.

Figure 7 — Size increase required by displacement (X)

6.4.4 Summary of recommendations

Minimum line thickness: 0,5 mm for every metre of viewing distance

Minimum dimension for significant detail: 1 mm for every metre of viewing distance

Symbol size to ensure legibility: 12 mm for every metre of viewing distance

Symbol size to ensure conspicuity: 25 mm for every metre of viewing distance

Maximum displacement: 250 mm for every metre of viewing distance

See annex C for example of sign development.

6.5 Orientation of symbols

When the meaning of a graphic symbol depends on its orientation or position, this should be clearly stated. The location of such symbols in rotating devices is particularly sensitive in this respect.

6.6 Distance between symbols

The distance between symbols in a composite information panel formed by two or more symbols should be sufficient to allow clear separation between individual symbols. As a guide, the space between symbols should be twice that between symbols and their enclosures, i.e. 2 d_{is}.

6.7 Symbol/text interaction

The proximity of a symbol and its associated text will affect the extent to which these two elements are perceived as a single unit.

In complex sign arrangements where symbols are associated with successive lines of text, the space between consecutive lines of text can affect the visual association of symbol and text. In such cases the text relevant to a particular symbol should be placed unambiguously in association with the corresponding symbol.

6.8 Symbol/text/arrow interaction

Where a directional arrow is associated with text, the arrow should be in close proximity to the text (see figure 8).

If a symbol is used in conjunction with the arrow, the symbol should be placed between the arrow and the text. Arrows pointing up, down or to the left should precede the text. Arrows pointing to the right should follow the text and the text itself should be set to that side of the frame. See ISO 4196.

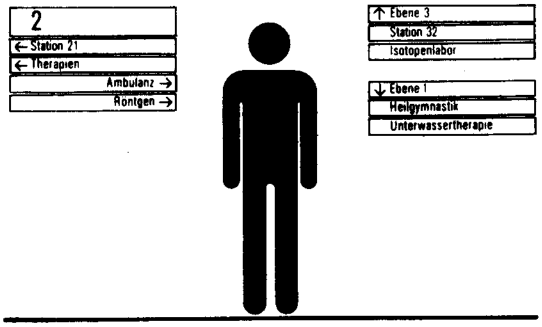


Figure 8 — Example of relative positioning of text and arrows

6.9 Public information symbols and corporate identities

It is recommended that corporate identity symbols should be visually separated from public information symbols to avoid confusion.

6.10 Tonal contrast

Changes in figure/ground tonal relation should be avoided within a set of symbols and within an information panel.

The recommendations in this Technical Report apply to dark symbols on a light background without internal illumination. Where the tonal contrast differs from this, i.e. a white symbol on a dark background, it may be necessary to prepare the design to compensate for optical distortions caused by these tonal changes.

Internally illuminated or reflective signs may also cause optical inconsistencies. Based on the analogous case of type design it may be necessary to compensate for these optical inconsistencies by allowing for a factor of up to 20 % in the size of some details, i.e. the actual width of illuminated strokes should be reduced by that percentage.

The high level of light in internally illuminated signs might improve conspicuity but impair legibility.

Where symbols appear on reflective or internally illuminated signs that are affected by both natural and artificial lighting conditions, extreme care should be taken to ensure consistent legibility under these different lighting conditions.

6.11 Use of colour and useful life of a sign

In general, the graphic form of a symbol reproduced in black and white will be sufficient for its identification.

Attention is drawn to the fact that certain colour combinations have specific meanings in some countries and this should be taken into account to avoid the introduction of ambiguities (see ISO 3864 and appropriate single sheet of ISO 7001).

It should also be borne in mind that some colours are more susceptible than others to fading, in both natural and artificial light. This may reduce the useful life of a sign and it is recommended that the sign be replaced when the original tonal contrast is impaired to a degree affecting the conspicuity and legibility of a sign.

Annex A

Specimen single sheet of ISO 7001

(The example has been slightly reduced for this reproduction.)

ISO 7001
Sheet No. : 004

1 Standard[1)]

Public information symbol :
Tram (streetcar)

Standard image content :
Electric tram (streetcar) in side view

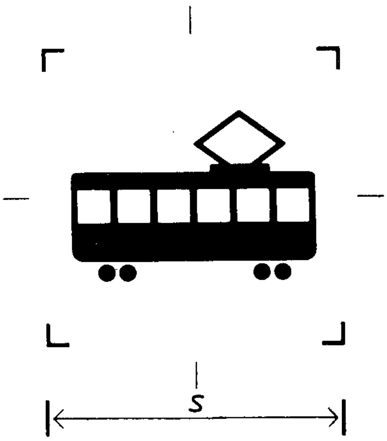
Function :
To signify transport facility by tram

Field(s) of application :
Buildings, services and public places
Maps, guides
Timetables

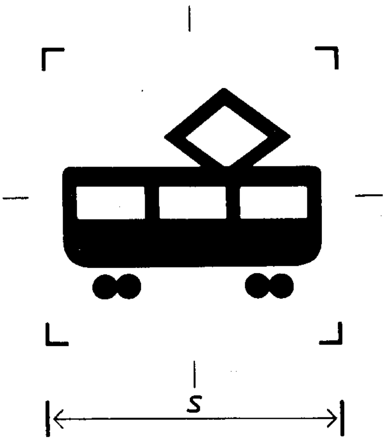
2 Additional information for guidance

This is not a standard but an example, the use of which is encouraged.

Guide-line example :
(s = 45 mm)
Size limits for the design below :
Minimum : s = 9 mm
Maximum : no limit



Guide-line example, simplified for small-scale reproduction (s = 45 mm) :
Size limits for the design below :
Minimum : s = 4 mm
Maximum : s = 9 mm



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1) This sheet should be used in conjunction with the "Introduction" and ISO/TR 7239.

Annex B

Structural elements of a sign

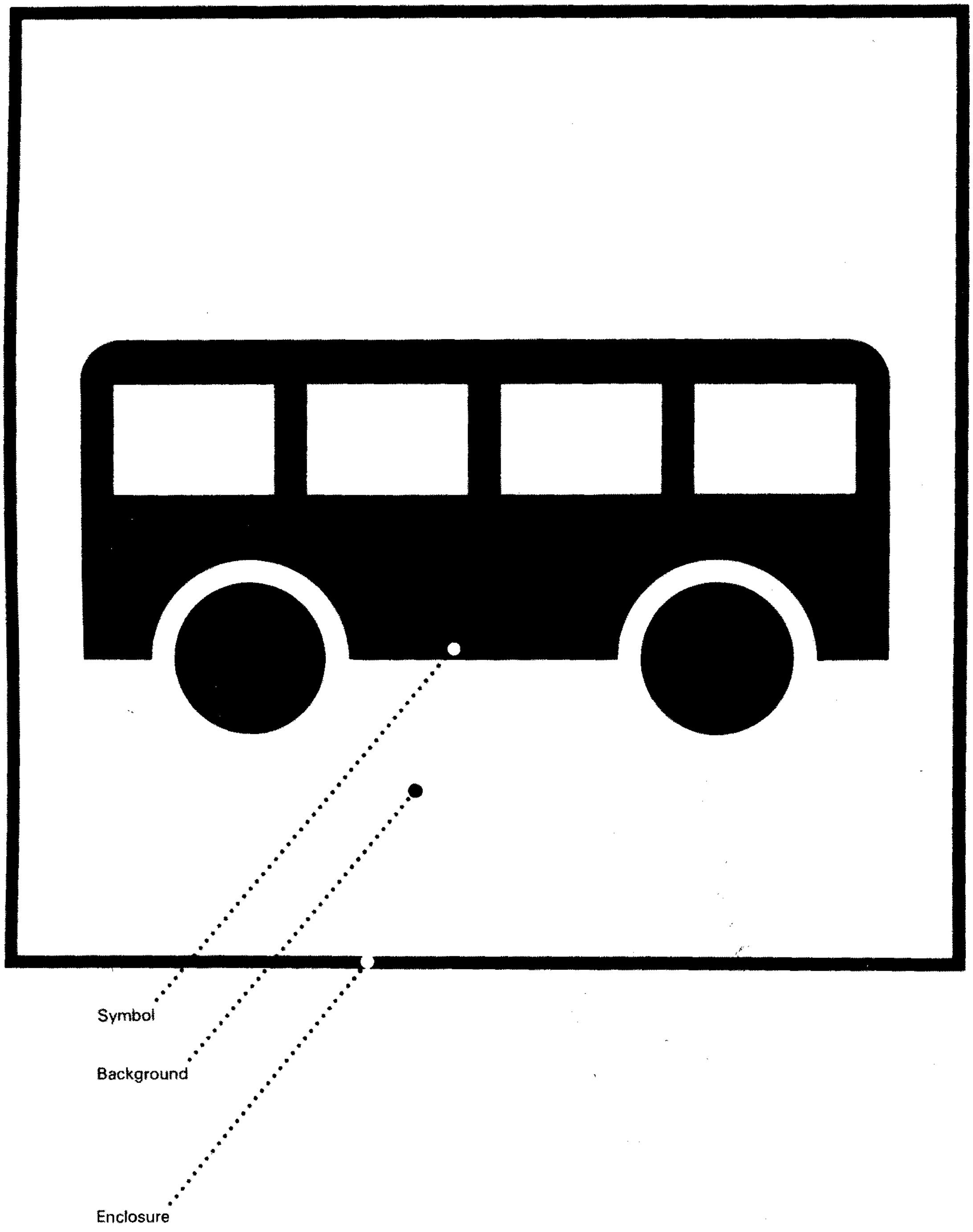


Figure 9 — Structural elements

Annex C

Example of sign development

C.1 Given a viewing distance (D) of 4 m, to design a conspicuous sign required in a triangular enclosure, follow the procedures set out below.

C.1.1 Calculate the symbol size (s):

$$s = \frac{25\,D}{1\,000} \text{ or } s = \frac{25 \times 4}{1\,000} = 100 \text{ mm}$$

C.1.2 Calculate the minimum dimension for significant detail (m_d):

$$m_d > \frac{D}{1\,000} \text{ or } m_d > \frac{4}{1\,000} = 4 \text{ mm}$$

C.1.3 Calculate the minimum line thickness (m_l):

$$m_l > \frac{D}{2\,000} \text{ or } m_l > \frac{4}{2\,000} = 2 \text{ mm}$$

C.1.4 Calculate the minimum distance between edge of symbol and inner edge of enclosure (d_{is}):

$d_{is} > 1{,}5\, m_d$ or $1{,}5 \times 4 = 6$ mm

C.1.5 Calculate the length of inner edge of triangular enclosure (b) necessary to maintain the symbol size:

$b < 1{,}7\, s$ or $1{,}7 \times 100 = 170$ mm

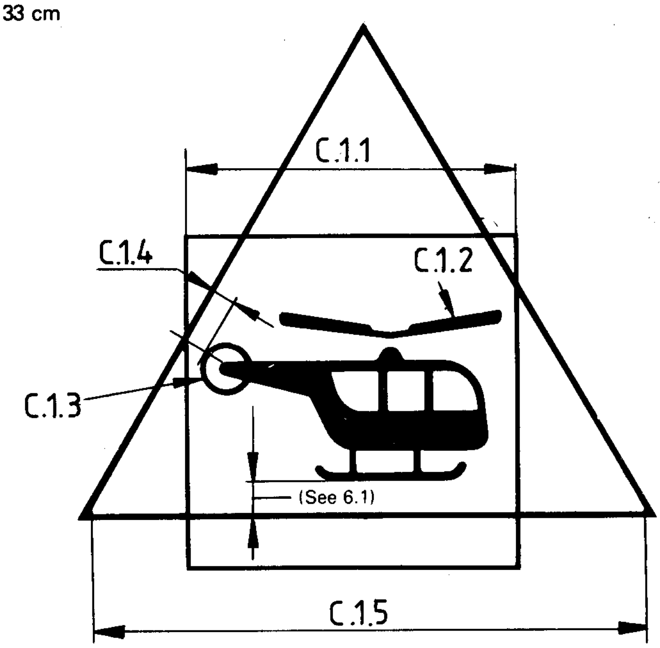
C.1.6 Produce sign.

C.1.7 Calculate maximum displacement from central line of normal direction of vision of the public (X):

$$X < \frac{D}{4} \text{ or } X < \frac{4}{4} = 1 \text{ m}$$

C.1.8 If it is a critical symbol, calculate displacement to obtain optimum conspicuity, i.e.:

$$X < \frac{D}{12} \text{ or } X < \frac{4}{12} = 33 \text{ cm}$$



Approximate scale 1:2

Figure 10 — Sign development

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This Indian Standard has been developed from Doc: No. MGP 01 (0452).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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